

REMARKS

This paper is in response to the Office Action mailed on 11/04/2004. In the Office Action, claims 1-4, 12-14, 16-17, 19, and 21 were (i) rejected under double patenting and (ii) rejected for being obvious. Reconsideration of the rejections and objections in view of the amendments and remarks made herein is respectfully requested.

Claims 16-17 have been amended by this response. Claims 5-11, 15, 18, and 20 were previously cancelled without prejudice. No claim has been cancelled by this response. No new claim has been added. Accordingly, claims 1-4, 12-14, 16-17, 19, and 21 remain pending in this application. Of those pending, claims 1, 12, and 16 are independent claims.

Applicant respectfully submits that no new matter has been added by this response.

I) Double Patenting Claim Rejection

In section 4 of the Office Action, claims 1-4, 12-14, 16-17, 19 and 21 were rejected under the judicially created doctrine of the obviousness-type double patenting in view of claims 1, 3, 13, 15-17, and 19 of United States Patent No. 6,631,452.

In response, Applicant herewith provides a terminal disclaimer executed by William W. Schaal, Reg. No. 39,018.

Mr. William W. Schaal is an attorney of record as indicated on page 3, Appendix A, of the "DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION" mailed in the parent patent application

and filed coincidentally with the filing of this continuation patent application referenced above.

U.S. Patent No. 6,631,452 and the present continuation patent application are commonly owned by The Institute for the Development of Emerging Architectures (IDEA), LLC.

Applicant believes that this rejection is now moot and respectfully requests the withdrawal of the judicial double patenting rejection of claims 1-4, 12-14, 16-17, 19 and 21.

II) Claim Rejections Under 35 U.S.C. § 103(a)

In section 6 of the Office Action, claims 1-4, 12-14, 16-17, 19 and 21 were rejected under 35 U.S.C. § 103(a) as obvious over the combination of U.S. Pat. No. 6,006,318 issued to Hansen et al. ("Hansen") in view of U.S. Pat. No. 6,128,728 issued to Eric M. Dowling ("Dowling"). Applicant respectfully traverses this rejection.

Applicant has amended independent claim 16 to clarify Applicant's claimed invention in that the register stack engine is to monitor a memory channel to determine the available bandwidth to a memory system. Dependent claim 17 has been amended accordingly to indicate that the register stack engine is to further monitor the load/store unit to determine the available bandwidth to the memory system.

The Office Action admits that Hansen does not disclose "a register stack engine to monitor activity on the memory channel for available bandwidth on the memory channel/bus and to transfer data between selected frames of the register file".

[Office Action, page 4, lines 17-21]. However, the Office Action asserts that Dowling "discloses the missing element that is known to be required in the system of Hansen in order to arrive at the Applicant's current invention". [Office Action, page 4, lines 21-24]. Applicant respectfully disagrees.

The Office Action asserts that "Dowling discloses the DMA/DRA controller (as being equivalent to the claimed register stack engine) for monitoring the bus (channel) activity to determine when unused memory bandwidth is available for moving/transferring the data contents between the shadow registers and memory buffer (e.g. see column 7, lines 43-49). [Office Action, page 4, line 25 to page 5, line 3]. Applicant respectfully disagrees.

Applicant's claimed memory channel allows Applicant's "register file [to] couple[] to the memory". [Claim 1, line 3]. Applicant's claimed "register/stack engine [] monitor[s] activity on the **memory channel**". (emphasis added) [Claim 1, lines 6-7].

Applicant's Figure 2 illustrates Applicant's memory channel 210. As described in the specification, Applicant's [m]emory channel 210 may include, for example, bus 180 and/or LSU 134." [Specification, page 8, lines 1-2]. As illustrated in Applicant's Figure 1, Applicant's bus 180 is not internal to Applicant's execution core 130.

In contrast, Dowling discloses that Dowling's DMA/DRA controller 340 monitors the **internal CPU bus activity** over the line 370 to determine when bandwidth is available between the register set and the memory." (emphasis added) [Dowling, Col. 13, lines 30-33; Figure 3]. Dowling's "control lines 370, 375 and 380 in FIG. 3 [are] between the DMA/DRA controller and the

processor core. The line 370 moves information relating to pipelined instructions to the controller to let it know what type of bus activity will occur on the next cycle." [Dowling, Col. 14, lines 10-14].

Thus, Applicant respectfully submits that Dowling does not disclose monitoring the activity on a memory channel as is claimed in independent claims 1, 16 or monitoring operations on a memory channel as is claimed in independent claim 12.

Assuming arguendo that Dowling is combined into Hansen, it is not clear that monitoring the internal CPU bus activity of Hansen's execution unit 100 will successfully determine the available bandwidth over any memory channel that may be disclosed by Hansen. The architecture of Hansen's execution unit 100 differs from that of Dowling's processor core 310. Moreover, the instructions used for Hansen's execution unit 100 differ from those used for Dowling's processor core 310. Thus, even if Dowling and Hansen are combined, it is not likely that monitoring the internal CPU bus activity of Hansen's execution unit 100 will determine the available bandwidth of a memory channel.

Additionally, the Office Action appears to be improperly using a hindsight analysis when it states that Dowling "discloses the missing element that is known to be required in the system of Hansen in order to arrive at the Applicant's current invention". [OA, page 4, lines 21-24]. The Office Action failed to cite a problem or suggestion from Hansen to combine it with Dowling.

Instead of monitoring the activity of a memory channel to maximize bus utilization and increase system throughput, Hansen suggests using "a high bandwidth interface 124 to communicate

with external memory and input output resources", "integrat[ing] several fast communication channels 156 (FIG. 13) to communicate externally", and "to further increase the bandwidth of the general purpose media processor 12, up to sixteen byte-wide packet communication channels 156 can be employed." [Hansen, Col. 18, lines 49-53; Col. 20, lines 49-52].

For the foregoing reasons, it is respectfully submitted that claims 1-4, 12-14, 16-17, 19 and 21 are not made obvious by Hansen and Dowling under 35 USC 103(a).

Accordingly, Applicant respectfully requests that the rejection of claims 1-4, 12-14, 16-17, 19 and 21 under 35 U.S.C. § 103(a) as being unpatentable over Hansen and Dowling be withdrawn.

III) Specification Amendment

Applicant has amended the "Cross Reference to Related Applications" section in order to update the status of the parent patent application as it is now issued. The "Cross Reference to Related Applications" section was added by preliminary amendment upon filing of this continuation patent application on 09/15/2003.

IV) Drawing Amendment

The drawing of Figure 1 has been amended.

The reference numbers 120 and 130 on the original drawing of Figure 1 is inconsistent with the usage in the paragraph in the specification beginning at page 6, line 10. In this paragraph, the instruction cache is designated using reference number 120 while the reference number 130 refers to the

execution core. Additionally, the specification refers to an "execution core" and not "execution resources" in the same paragraph.

Thus, Applicant has amended Figure 1 by swapping reference numbers 120 and 130 and by replacing "RESOURCES" with --CORE--.

A clean replacement sheet of amended Figure 1 is attached hereto as Appendix I. An annotated sheet indicating the amendment in red to the drawing of Figure 1 is attached hereto as Appendix II.

Applicant respectfully submits that no new matter has been added to the drawings by these amendments and requests approval by the Examiner.

CONCLUSION

In view of the foregoing it is respectfully submitted that the pending claims are in condition for allowance.

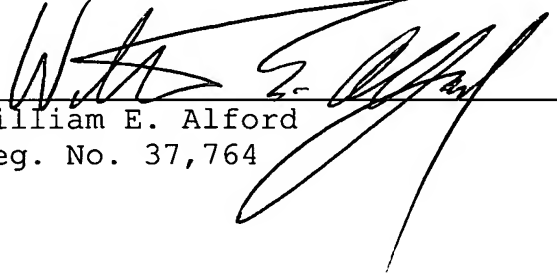
Reconsideration of the rejections and objections is requested. Allowance of the claims at an early date is solicited.

The Examiner is invited to contact Applicant's undersigned counsel by telephone at (714) 557-3800 to expedite the prosecution of this case should there be any unresolved matters remaining.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees in connection with the filing of this paper, including extension of time fees, to Deposit Account 02-2666 and please credit any excess fees to such deposit account.

Respectfully submitted,
BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP

Dated: March 4, 2005



William E. Alford
Reg. No. 37,764

12400 Wilshire Boulevard,
Seventh Floor
Los Angeles, California 90025
(714) 557-3800

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to Commissioner for Patents, P.O. Box 1450 Alexandria, VA 22313-1450 on: March 4, 2005.



Pat Sullivan

3/4/05
Date

IN THE DRAWINGS

Applicant has amended Figure 1 by swapping reference numbers 120 and 130. Applicant has further amended Figure 1 by replacing "RESOURCES" with --CORE--.

A clean replacement sheet of amended Figure 1 is attached hereto as Appendix I.

An annotated sheet indicating the amendment in red to the drawing of Figure 1 is attached hereto as Appendix II.

Appl. No. 10/663,247
Amdt. Dated: 03/04/2005
Reply to Office Action of 11/04/2004



Appendix I

CLEAN FORMAL DRAWING SHEET
FIGURE 1

Appl. No. 10/663,247
Amdt. Dated: 03/04/2005
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Appendix II

ANNOTATED DRAWING SHEET TO SHOW AMENDMENT
FIGURE 1

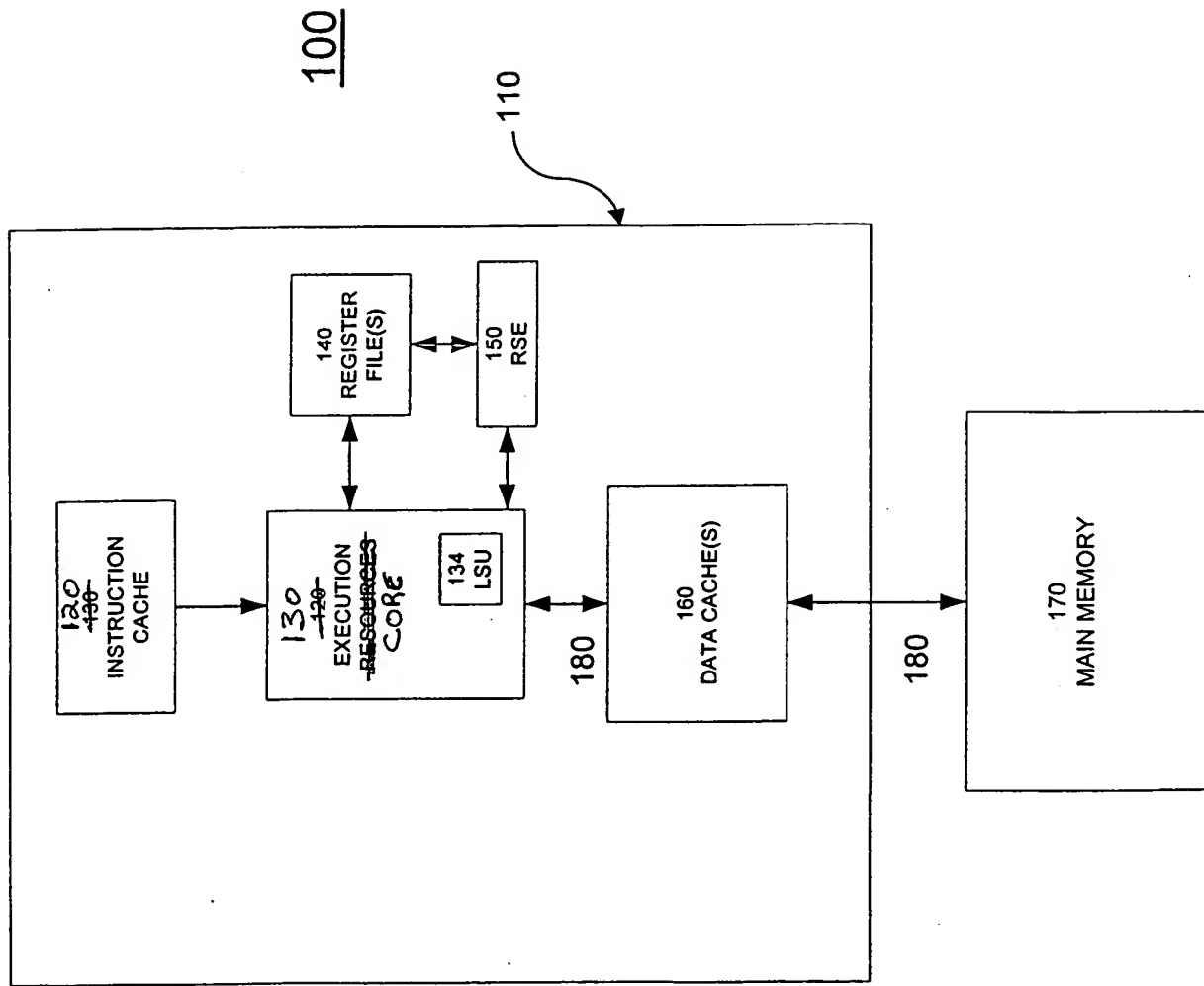


Fig. 1